

2. A method of manufacturing an external force detection sensor comprising the steps of:

forming a recessed part on a back surface side of an element substrate;

forming a membrane on a face side;

providing an etching stop layer comprising an electrically conductive material on a top surface of the recessed part of said element substrate;

joining the back surface side of said element substrate with a support substrate; and

forming a sensor element including a vibrating body, fixed electrodes and movable electrodes by dry etching of the membrane of said element substrate;

removing the etching stop layer; and

completing the manufacturing of the external force detection sensor.

5. A method of manufacturing an external force detection sensor according to claim 13, wherein the dummy support substrate and the etching stop layer are removed after the sensor element is formed and, after that, a support substrate with a recessed part formed therein is arranged on a back surface side of said element substrate such that the recessed part of said support substrate is arranged opposite to the sensor element and, then the support substrate is joined with the element substrate.

9. A method of manufacturing an external force detection sensor according to claims 2 or 3, wherein the element substrate is formed of a silicon material, the support substrate is formed of a glass material, and the element substrate is anodically joined with the support substrate.

10. A method of manufacturing an external force detection sensor according to one of claims 1, 2, 3 or 9, wherein the etching stop layer is formed of an electrically conductive material whose etch selectivity which is the ratio of the dry-etch rate of an element substrate to the dry-etch rate of an etching stop layer is not less than 1.

Please cancel claims 4, 6-8 and 11 without prejudice or disclaimer of the subject matter contained therein.

Please add Claims 13-16 as follows:

claim 13 13. A method of manufacturing an external force detection sensor according to claim 1, further comprising the step of providing a dummy support substrate to support the element substrate during the step of through-hole dry etching of the element substrate to form the sensor element, wherein the etching stop layer is formed between the element substrate and the dummy support substrate.

claim 14 14. A method of manufacturing an external force detection sensor according to claim 1, wherein the etching stop layer is formed in a preset sensor element forming area on a back surface side of the element substrate.

claim 15 15. A method of manufacturing an external force detection sensor according to claim 1, further comprising the step of forming a membrane by machining a preset sensor element forming area of the element substrate from both face and back surface sides, and then forming the etching stop layer on a back surface side of the membrane.

16. A method of manufacturing an external force detection sensor comprising the steps of:

providing an element substrate;

providing a support substrate;

forming a recess in a surface of the ^{element substrate} substrate-element;

providing an etching stop layer comprising an electrically conductive material on a back surface of said element substrate;

joining the back surface side of said element substrate with the surface of the support substrate having said recess formed therein; and

forming a sensor element including a vibrating body, fixed electrodes and

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11 → movable electrodes by dry etching of the membrane of said element substrate;
removing the etching stop layer; and
completing the manufacturing of the external force detection sensor.

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